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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

EXAMINER

KIM, CHONG R

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/820,376	Applicant(s) TAJIMA, JOHJI	
	Examiner Charles Kim	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment and Arguments

1. Applicant's amendment filed on January 17, 2006 has been entered and made of record.
2. Applicant's arguments have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicants argue (page 18) that their claimed invention differs from the prior art because "there is no disclosure in Eraslan of detecting an actual three-dimensional shape." The Examiner disagrees. As illustrated in figures 5 and 6, Eraslan clearly discloses the step of detecting a three-dimensional shape of person's face. Eraslan explains that a 3-D human head is detected (figure 1), and is divided into facial feature parts and stored in a memory (col. 12, lines 3-6 and lines 16-20). Thus, the detected 3D head in figure 1 and the detected 3D facial feature parts in figures 5-6 clearly represent a detected 3D shape of the person's face.

Applicants further argue (page 19) that neither Eraslan nor Beymer disclose "how to correct shades in an image caused by illumination." The Examiner responds by pointing out that the claim language does not recite the step of correcting shades in an image caused by illumination. The closest instance to this feature appears to be in the limitation, "generating referential face image data based on the shooting conditions...wherein the shooting conditions comprise illumination conditions" as recited in independent claims 1, 2, 9-12, 19, 21, 23 and 25. In this case, Beymer discloses the step of generating referential face image data based on shooting conditions comprising illumination conditions (page 757, section 2, right column and page 759, section 4.2). Thus, the combination of Eraslan and Beymer appear to still be

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applicable to claims 1, 2, 9-12, 19, 21, 23 and 25, as amended. However, neither Eraslan nor Beymer appear to disclose that the shooting conditions comprise illumination conditions for correcting shades in an image caused by different lighting directions.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-14, 19, 21-34, 40, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Eraslan, U.S. Patent No. 6,381,346 ("Eraslan") and the article entitled "Face Recognition Under Varying Pose" by Beymer ("Beymer").

Referring to claim 1, Eraslan discloses a face recognition method for identifying a person by detecting a three-dimensional shape of the person's face and a surface reflectance image thereof and collating the detected three-dimensional shape of the face and the surface reflectance image with enquiry face image data, comprising:

- a. generating referential face image data based on the detected three-dimensional shape and an reflectance image of the surface thereof (col. 9, lines 17-23 and col. 12, lines 1-4);
- b. comparing the referential face image data to the enquiry face image data (col. 14, line 48-col. 15, line 23. Note that the facial image of a suspect in col. 14, lines 48-50 is interpreted as the enquiry face image data); and

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c. identifying the person of the enquiry face image data with the person of the referential face image data based on a difference between the face image data (col. 15, lines 25-28).

Eraslan does not explicitly disclose that the referential face image data is generated based on shooting conditions comprising illumination conditions of the enquiry face image data. However, this feature was exceedingly well known in the art. For example, Beymer discloses the step of generating referential face image data that is based on shooting conditions comprising illumination conditions of enquiry face image data (page 758-759, sections 4.1 and 4.2).

Eraslan and Beymer are combinable because they are both concerned with facial recognition systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the referential face image data of Eraslan so that it is based on the shooting conditions of Beymer. The suggestion/motivation for doing so would have been to enhance the flexibility of the system by providing the capability of recognizing faces under varying conditions with increased accuracy (Beymer, pages 760-761). Therefore, it would have been obvious to combine Eraslan with Beymer to obtain the invention as specified in claim 1.

Referring to claim 2, Eraslan discloses a face recognition method having database which stores detected three-dimensional shapes of human faces and surface reflectance images thereof for identifying a person by collating the detected three-dimensional shape of the specific person's face and the surface reflectance image stored in the database with enquiry face image data, comprising:

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- a. generating referential face image data based on the detected three-dimensional shape and the surface reflectance image stored in the database (col. 9, lines 17-23 and col. 12, lines 1-4);
- b. comparing the referential face image data to the enquiry face image data (col. 14, line 48-col. 15, line 23. Note that the facial image of a suspect in col. 14, lines 48-50 is interpreted as the enquiry face image data); and
- c. identifying the person of the enquiry face image data with the person of the referential face image data based on a difference between the face image data (col. 15, lines 25-28).

Eraslan does not explicitly disclose that the referential face image data is generated based on shooting conditions comprising illumination conditions of the enquiry face image data. However, this feature was exceedingly well known in the art. For example, Beymer discloses the step of generating referential face image data that is based on shooting conditions comprising illumination conditions of enquiry face image data (page 758-759, sections 4.1 and 4.2).

Eraslan and Beymer are combinable because they are both concerned with facial recognition systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the referential face image data of Eraslan so that it is based on the shooting conditions of Beymer. The suggestion/motivation for doing so would have been to enhance the flexibility of the system by providing the capability of recognizing faces under varying conditions with increased accuracy (Beymer, pages 760-761). Therefore, it would have been obvious to combine Eraslan with Beymer to obtain the invention as specified in claim 2.

Referring to claim 3, Beymer further discloses that the shooting conditions comprise an angle of the face image and lighting directions (page 757, section 2, right column and page 759, section 4.2).

Eraslan further discloses that the detected three-dimensional shape is specified by shape data and color image data (col. 9, lines 18-23).

Referring to claim 4, see the rejection of at least claim 3 above.

Referring to claim 5, Eraslan does not explicitly disclose that the reference face image and the enquiry face image are compared after locations of characteristic points, size and brightness of both the face image data have been normalized. However, these features were exceedingly well known in the art. For example, Beymer discloses that the referential face image and the enquiry face image are compared after locations of characteristic points, size and brightness of both the face image data have been normalized (pages 758-759, sections 4.1 and 4.2).

Eraslan and Beymer are combinable because they are both concerned with facial recognition systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the method of Eraslan in view of Beymer. The suggestion/motivation for doing so would have been to enhance the accuracy of the facial recognition process. Therefore, it would have been obvious to combine Eraslan with Beymer to obtain the invention as specified in claim 5.

Referring to claim 6, see the rejection of at least claim 5 above.

Referring to claim 7, Eraslan does not explicitly disclose that the reference face image and the enquiry face image are compared after locations of characteristic points, size and

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brightness of both the face image data have been normalized as parameters. However, these features were exceedingly well known in the art. For example, Beymer discloses that the referential face image and the enquiry face image are compared after locations of characteristic points, size and brightness of both the face image data have been normalized as parameters (pages 758-759, sections 4.1 and 4.2).

Eraslan and Beymer are combinable because they are both concerned with facial recognition systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the method of Eraslan in view of Beymer. The suggestion/motivation for doing so would have been to enhance the accuracy of the facial recognition process. Therefore, it would have been obvious to combine Eraslan with Beymer to obtain the invention as specified in claim 7.

Referring to claim 8, see the rejection of at least claim 7 above.

Referring to claim 9, see the rejection of at least claim 1 above.

Referring to claim 10, see the rejection of at least claim 2 above.

Referring to claim 11, see the rejection of at least claim 1 above. Eraslan further discloses an image input means for obtaining the enquiry face image (col. 14, lines 48-55).

Referring to claim 12, see the rejection of at least claim 2 above. Eraslan further discloses an image input means for obtaining the enquiry face image data (col. 14, lines 48-55).

Referring to claims 13 and 14, Eraslan further discloses that the surface image is a color image (col. 9, lines 17-23).

Referring to claim 19, see the rejection of at least claim 10 above. Eraslan further discloses an image input means for obtaining the enquiry image data (col. 14, lines 48-55).

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Referring to claim 21, see the rejection of at least claim 2 above.

Referring to claim 22, see the rejection of at least claim 3 above.

Referring to claim 23, see the rejection of at least claim 19 above.

Referring to claim 24, see the rejection of at least claim 3 above.

Referring to claim 25, see the rejection of at least claim 9 above.

Referring to claim 26, Eraslan further discloses that the referential face image data is generated by using a graphics means (col. 14, lines 48-55).

Referring to claims 27-32, see the rejection of at least claim 26 above.

Referring to claim 33, Beymer further discloses that the shooting conditions comprise a plurality of lighting directions (page 757, right column. Note that the “60 watt lamp near the camera supplemented by background lighting from windows and overhead lights” provides a plurality of lighting directions).

Referring to claims 34, 40, 41, see the rejection of at least claim 33 above.

4. Claims 15-18, 20, 35-39, 42-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Eraslan, U.S. Patent No. 6,381,346 (“Eraslan”), the article entitled “Face Recognition Under Varying Pose” by Beymer (“Beymer”) and Wang et al., U.S. Patent No. 6,035,055 (“Wang”).

Referring to claim 15, see the discussion of at least claim 3 above. Beymer further discloses a normalizing means for normalizing the referential face image data and the enquiry face image data respectively, and an image comparing means for comparing outputs of the

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normalizing means that comprise a normalized enquiry image and a normalized referential color image (pages 758-759, sections 4.1 and 4.2).

Eraslan and Beymer do not explicitly disclose that the referential face image data and the enquiry face image data are normalized using a standard face image as the basis. However, this feature was exceedingly well known in the art. For example, Wang discloses a means for normalizing face image data using a standard face image as the basis (col. 10, lines 10-17).

Eraslan, Beymer, and Wang are all concerned with facial recognition techniques. Wang enhances the face recognition process by providing an effective and efficient search and retrieval of the face images (Wang, col. 2, lines 15-19). Therefore, it would have been obvious to modify the normalizing step of Eraslan and Beymer, so that the referential face image data and the enquiry face image data are normalized using a standard face image as the basis, as taught by Wang, in order to enhance the face recognition process.

Referring to claims 16-18, 20, see the rejection of at least claim 15 above.

Referring to claims 35-39, see the rejection of at least claim 33 above.

Referring to claim 42, Beymer further discloses that the normalizing means normalizes the location of characteristic points (eyes), size (scaling) and brightness (preprocessing to introduce invariance to lighting conditions) of both the referential face image data and the enquiry face image data (pages 758-759, sections 4.1 and 4.2).

Referring to claims 43-45, see the rejection of at least claim 42 above.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Roy et al. U.S. Patent No. 6,956,569 discloses a 3D facial recognition method that deals with variations in lighting conditions.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ck

March 10, 2006

JINGGEWU
PRIMARY EXAMINER

